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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/665,530
Filing Date: September 22, 2003
Appellant(s): HARCHANKO, JOHN S.

Mark E. Olds
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed November 27, 2007 appealing from the Office action mailed November 22, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

7,006,426	CHIU ET AL	02-2006
6,716,409	HAFNER ET AL	04-2004

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 15-16, 18, and 20-25 are rejected under 35 U.S.C. 102(e) as being anticipated by Chiu et al US 7,006,426, herein referred to as Chiu et al '426.

Regarding claim 15, Chiu et al '426 discloses a multi-optical element device comprising: at least one reference optical element (Column 1, lines 28-39 and Column 2, lines 12-31, wherein the reference optical element is one of multiple lens elements "12" that are formed on wafer "10", Figures 1-4); a mounting system, wherein the mounting system is formed by etching a substrate to form a recess to receive a reference optical element (Column 2, lines 1-11 and Column 2, line 54-Column 3, line 8, wherein the mounting element "20" is etched to form recesses "48" and "50" in base elements "22", Figures 1-4), where said recess at least partially conforms to the shape of the reference optical element (Column 2, lines 1-11 and Column 2, line 54-Column 3, line 8, wherein the recesses "48" and "50" of base elements "22" are shaped to conform to the shape of extensions "44" and "46" of lens element "12", Figure 4) , and wherein the reference optical element is attached to the recess in the substrate (Column 2, lines 1-11 and Column 2, line 54-Column 3, line 8, wherein the reference optical element, i.e. one of the lens

elements "12" as shown above, is attached and aligned with the substrate "20" by connection with the recesses "48" and "50", Figure 4), the mounting system contains an etched substrate forming structures upon which optical devices can be attached (Column 2, lines 1-11 and Column 2, line 54-Column 3, line 8, wherein the mounting element "20" is etched to form structures "22" upon which lens elements "12" are attached, Figures 1-4); and at least a first optical element attached to a predetermined structure of the etched structures (Column 2, lines 1-11 and Column 2, line 54-Column 3, line 8, wherein at least a first optical element, specifically an additional lens element "12", is attached to the structures "22" of mounting element "20", Figures 1-4).

Regarding claim 16, Chiu et al '426 further discloses that the reference optical element and/or the first optical element are made from glass (Column 1, lines 28-39, wherein the lens elements"12" are made from glass, Figures 1-4).

Regarding claim 18, Chiu et al '426 further discloses that the etched structure is covered with a filling compound to change the index of refraction (Column 2, line 32-Column 3, line 8, wherein the etched structures "22" are coated with thin films to change the reflectivity of the mounting structures and at least partly fill the space between the mounting structures and the optical elements, and wherein the structures are also coated with an adhesive for bonding and specifically Column 2, lines 32-53, wherein the thin films are disclosed to be about 62 percent or 90 percent reflective, thereby transmitting about 38 percent or 10 percent of the light, thereby changing the transmission properties and refractive index of the etched structures "22", Figures 1-4).

Regarding claims 20-23, Chiu et al '426 further discloses that the thickness of the reference and first optical elements are between several millimeters and 1 nanometer (Column 1, lines 40-53, wherein the thickness of the wafer used to form lens elements "12" is 0.75 mm, Figures 1-4).

Regarding claim 24, Chiu et al '426 further discloses that the reference optical element and the first optical element are aligned along substantially the same optical axis (Column 3, line 50-Column 4, line 4, wherein the light beam passes along the optical elements "12" through a horizontal optical axis "84", wherein the optical elements "12" are substantially aligned along this axis, Figures 1-4).

Regarding claim 25, Chiu et al '426 further discloses that the reference optical element and the first optical element are aligned in a substantially perpendicular direction with respect to a line through the center of each optical element (Column 3, line 50-Column 4, line 4, wherein the optical elements "12" including the reference optical element and the first optical element are aligned perpendicular to a line drawn through the center of the optical elements in the horizontal direction, Figures 1-4).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 17 and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiu et al '426 as applied to independent claim 15 above.

Regarding claim 17, Chiu et al '426 discloses a multi-optical element as shown above, but does not specifically disclose that the optical elements are made from GaP. However, it is well known in the art of optical elements in semiconductor devices to be made of GaP for the purpose of making elements with narrow band gaps and good lattice conformity. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made for the optical elements of Chiu et al '426 to be made from GaP since it is well known in the art of optical elements in semiconductor devices to be made of GaP for the purpose of making elements with narrow band gaps and good lattice conformity.

Regarding claim 26, Chiu et al '426 discloses a reference optical lens element as shown above, but does not specifically disclose that the reference optical element has a convex surface shape to fill a curved shaped of a recess of the mounting structure. However, it is well known in the art of optical elements for optical elements to be convex shaped and for the recesses of the mounting structure to have a curved shaped for the purpose of converging light that passes through the device and to provide a more uniform distribution of light through the optical device. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made for the reference optical lens element of Chiu et al '426 to have a convex shape to fill a curved shaped of a recess of the mounting structure since it is well known in the art of optical elements for optical elements to be convex shaped and for the recesses of the mounting structure to have a curved shaped for the purpose of converging light that passes through the device and to provide a more uniform distribution of light through the optical device.

Regarding claim 27, Chiu et al '426 discloses a multi-optical element as shown above wherein the etched structure forms a cavity and the reference optical element is located inside the

cavity (Column 2, lines 1-11 and Column 2, line 54-Column 3, line 8, wherein the lens elements "12" are attached and aligned with the substrate "20" by being held in recesses "48" and "50", Figure 4), including a filling compound (Column 2, line 32-Column 3, line 8, wherein the etched structures "22" are coated with thin films to change the reflectivity, i.e. the refractive index, of the mounting structures and at least partly fill the space between the mounting structures and the optical elements, and wherein the structures are also coated with an adhesive for bonding), but does not specifically disclose that the filling compound is used to fill the cavity. However, it is well known in the art of optical elements for the elements to be held together by cavities filled with adhesive for the purpose of forming strong bonds between the optical elements and thereby decrease movement of the elements. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made for the filling compound of Chiu et al '426 to fill the cavity since it is well known in the art of optical elements for the elements to be held together by cavities filled with adhesive for the purpose of forming strong bonds between the optical elements and thereby decrease movement of the elements.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chiu et al '426 as applied to independent claim 15 above, and further in view of Hafner et al US 6,716,409, herein referred to as Hafner et al '409.

Regarding claim 19, Chiu et al '426 discloses a multi-optical element including a filling compound as shown above, but does not specifically disclose that the filling compound is Epoxy-Master Bond EP19HT. Hafner et al '409 teaches of using an optical adhesive, specifically Epoxy-Master Bond EP19HT, join nanotubes to a silicon material (Column 11, lines 1-25, wherein nanotubes are joined to silicon with EP19HT) for the purpose of providing an adhesive

that will not cure with exposure to air or water and can withstand exposure to water once cured (Column 11, lines 1-25). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made for the filling compound of Chiu et al '426 to be Epoxy-Master Bond EP19HT since Hafner et al '409 teaches of using an optical adhesive, specifically Epoxy-Master Bond EP19HT, join nanotubes to a silicon material for the purpose of providing an adhesive that will not cure with exposure to air or water and can withstand exposure to water once cured.

(10) Response to Argument

Applicant's argument against the 102 (e) rejection of independent claim 15 over Chui et al '426 is that the optical element "12" cannot be both the reference optical element and the first optical element. However, the examiner disagrees, since there are multiple optical elements "12" formed on wafer "10" and attached to the mounted system "20" of Chui et al '426 and therefore one of the optical elements is the reference element and the others are the "at least first optical elements" (Column 2, lines 1-11 and Column 2, line 54-Column 3, line 8, wherein additional lens elements "12" are attached to the structures "22" of mounting element "20", Figures 1-4).

Applicant's second against the 102 (e) rejection of claim 18 over Chui et al '426 is that the "reflective thin films" of Chiu et al '426 are not a filling compound to change the index of refraction. However, the examiner disagrees since these films change the reflectivity, of the mounting structures and at least partly fills the space between the mounting structures and the optical elements and thereby is a filling compound that changes the index of refraction (Column 2, line 32-Column 3, line 8, wherein the etched structures "22" are coated with thin films to change the reflectivity of the mounting structures and at least partly fill the space between the

mounting structures and the optical elements, and wherein the structures are also coated with an adhesive for bonding). Specifically, the reflective films are partially reflective and thereby change the transmission of light through the device and thereby the refractive index (Column 2, lines 32-53, wherein the thin films are disclosed to be about 62 percent or 90 percent reflective, thereby transmitting about 38 percent or 10 percent of the light, thereby changing the transmission properties and refractive index of the etched structures "22", Figures 1-4).

Applicant's third argument against the 103(a) rejection of claim 26 over Chui et al '426 is that no supporting reference was provided to shown that it is well known in the art of optical elements for optical elements to be convex shaped and for the recesses of the mounting structure to have a curved shaped for the purpose of converging light that passes through the device and to provide a more uniform distribution of light through the optical device. However, it is not required that the examiner provide a specific reference to show "the simple substitution of one known element for another" which would yield a predictable result. See Ex Parte Smith, 83 USPQ.2d 1509, 1518-19 (BPAI, 2007) (citing KSR v. Teleflex, 127 S.Ct. 1727, 1740, 82 USPQ2d 1385, 1396 (2007)) and MPEP 2143 (B).

Applicant's third argument against the 103(a) rejection of claim 27 over Chui et al '426 is that no supporting reference was provided to shown that it is well known in the art of optical elements for the elements to be held together by cavities filled with adhesive for the purpose of forming strong bonds between the optical elements and thereby decrease movement of the elements. However, it is not required that the examiner provide a specific reference to show "the mere application of a known technique to a piece of prior art ready for improvement" which would yield a predictable result. See Ex Parte Smith, 83 USPQ.2d 1509, 1518-19 (BPAI, 2007)

(citing KSR v. Teleflex, 127 S.Ct. 1727, 1740, 82 USPQ2d 1385, 1396 (2007)) and MPEP 2143 (B).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Jessica Stultz

February 15, 2008

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